

Zero Retries issue 0173 2024-10-11

Zero Retries is an independent newsletter promoting technological innovation that is occurring in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Radios are computers - with antennas! Now in its fourth year of publication, with 2100+ subscribers.

About Zero Retries

Steve Stroh N8GNJ, Editor

Jack Stroh, Late Night Assistant Editor Emeritus

In this issue:

- **Request To Send**
- **Public Service Announcement for Preparedness**
Don Rotolo N2IRZ
- **A Few More Observations About 21st Century Emergency Communications - Via Satellite**
Steve Stroh
 - Apple iPhone Satellite Messaging
 - Starlink and T-Mobile Special Temporary Authority to Activate Satellite to Phone Capability
 - Satellite to Phone Wireless Emergency Alerts
- **ARRL's Dismissive Arrogance re: Technician Class Amateur Radio Operators**
Steve Stroh N8GNJ
- **ZR > BEACON**
 - Audio Recording in ka9q-web
 - amprv6.org
 - Meet Schuyler Erle N0GIS, ARDC's New Director of Technology
 - ARDC Committee Recruitment 2025
 - Wi-Fi Goes Long Range on New WiLo Approach
 - CESSB update (Controlled Envelope SSB) on the QMX+
 - KV4P HT - Turn Your Android Phone Into a Modern Ham Radio Transceiver
- **Join the *Fun* on Amateur Radio**
- **Closing The Channel**
- **Footnotes for this Issue**
- **Comments for This Issue** (redirect to Comments page)

Web version of this issue - <https://www.zeroretries.org/p/zero-retries-0173>

Request To Send

Commentary by Editor Steve Stroh N8GNJ

Paid Subscribers Update

My thanks to **Prefers to Remain Anonymous 13** for *renewing* as an **Annual Paid Subscriber** to Zero Retries this past week!

My thanks to **Prefers to Remain Anonymous 54** for becoming an **Annual Paid Subscriber** to Zero Retries this past week!

Financial support from Zero Retries readers is a significant vote of support for the continued publication of Zero Retries.

Upcoming Events Countdown

[Pacificon 2024](#) in San Ramon, California, USA on 2024-10-18 thru 20 *next weekend*. Tina KD7WSF and I will be attending Pacificon 2024 (which makes

it “major” to us).

My presentation at Pacificon 2024 - **Tracking Technological Innovation in Amateur Radio** will be on Saturday 2024-10-19 from 16:00 - 16:50 in Contra Costa Salon 2.

See the **Zero Retries Guide to Zero Retries Interesting Events** for additional events.

Putting Our Wood Behind The Arrows That Matter

AI summary of the original version of this phrase - “Put all your wood behind one arrowhead” is an expression that means to focus your efforts to achieve maximum effect. The idea is that spreading out your efforts means no single activity will be fully realized.

A couple of stories in this issue may give the casual or new reader of Zero Retries the idea that Amateur Radio “should get out of emergency communications”. That impression wouldn’t be correct. But, in my opinion, Amateur Radio shouldn’t be trying “fix solved problems”. One example is sending email via Winlink from a mass casualty shelter. Imagine the scenario - a ham showing up at a shelter with their VHF / UHF or HF go kit, computer, modem, radio, and documentation, plus antenna(s) and power supply. Hand out a bunch of forms to the folks that are sheltering there, and then the Amateur Radio Operator transcribes all of those messages into Winlink messages.

Now imagine an alternate scenario - an IT professional (who’s also an Amateur Radio Operator) shows up at the same shelter with their Starlink user terminal and a case full of accessories like Ethernet cables, a spare Wi-Fi AP, etc. She thought ahead and bought the longest available Starlink interconnection cable so she can put the Starlink antenna in a clear spot and sit comfortably inside. She writes a few things on a piece of paper and tapes that to the edge of the table. What she wrote is:

Please feel free to use my Starlink system to get online with your phone.

The Wi-Fi name is: **STARLINK**

The Wi-Fi password is: **emergency**

On your phone, if you turn on the setting
“**Voice Over Wi-Fi**”, you can also make voice calls.

No thanks needed, I’m just happy to help people reconnect with their loved ones.

When I was a young Amateur Radio Operator, one of the most valuable things an Amateur Radio Operator could do was temporarily interconnecting a repeater to the phone network to be able to make a free (half duplex) telephone call via radio - Autopatch. In that era, mobile phones were rare, expensive, and the mobile phone system of the era didn’t have a lot of capacity. Thus Autopatch was a valuable service of Amateur Radio.

We don’t do Autopatch any more; I haven’t heard an autopatch call over a repeater in decades. We don’t do that any more because we very, very rarely *need* to given that everyone has a mobile phone. And if someone doesn’t happen to have their own mobile phone (lost, stolen, or just prefer not to have one), the person nearest to them will have a mobile phone that they can probably borrow to make a quick phone call.

With Starlink (and other similar systems that may follow), we’re now to that point with doing emergency email over radio. It makes more sense to provide broadband Internet access, via Starlink, *directly* in an emergency instead of unnecessarily putting Winlink and slow radio links in the middle of an email communication.

Thus in my opinion, the “wood” we should be applying behind our Amateur Radio “arrow” is experimentation, development, and training about radio technology, and having fun doing that with things like Parks and Peaks On The Air, transmitter hunts, very low power communications, email and file sharing via data communications, etc. It’s still a valuable skill to know how to set up a radio in emergency conditions (the basics of power, antennas, pre-arranged frequencies, etc.) but let’s do that in scenarios where Amateur Radio is the most viable communication method, not a “forced fit” like many situations now that Starlink is an easy to access and use capability.

Have a great weekend, all of you co-conspirators in Zero Retries Interesting Amateur Radio activities!

Steve N8GNJ

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Public Service Announcement for Preparedness

Don Rotolo N2IRZ

*Editor’s Note - In the aftermath of Hurricane Helene, there is water, water, everywhere, and not a drop to drink. My thanks to N2IRZ for these very good, basic points about survival in a disaster. Without the basics of life, like safe water, and especially **enough** safe water, the “nice to haves” like communications won’t make a difference.*

Disasters generally affect infrastructure, and it universally takes at least a few days to respond to these effects. Consider [Hurricane] Helene and Western North Carolina: Major flooding significantly damaged power and water infrastructure, and washouts and fallen trees rendered virtually every road impassable, delaying emergency response for a few days. No water, no food, no power and no help on the way. How will you (literally) survive?

In NC, some local supermarkets have generators and so were able to help some residents with food and water, but this disappeared quickly. We all know that we can survive a week or two without food (uncomfortably, perhaps) but more than a day or two without drinking water can be fatal.

The point is that some simple steps can prepare you to survive a disaster. Keep at least 3 days’ worth of water and nonperishable food stashed away. Plan

on at least one gallon a day per person for water, and dry or canned food that can be eaten as-is. This is above and beyond what's in the cupboard right now. Pets have needs too, perhaps less water but more food, as pet supplies may not recover for weeks. And don't forget some money, in smaller bills and change, since banks and ATMs, as well as credit-card processing, will be unavailable for a week or more.

Don't forget everyday items you will need, like a can opener, some butane lighters (to light a fire), and other supplies (like plates, cups, toilet paper, soap), since the contents of your home might be completely unusable. Start today by making a list of what you think you'll need, then start collecting it. Buy products with distant 'best-by' dates, sticking to the cheapest brands because you'll hopefully never eat it, but if you have to, it'll still keep you alive: Perrier is no better than Costco water in a disaster.

If you take absolutely essential-to-life medications, have a week's supply (or more) stored separately, replacing it every few months.

Store it all in a plastic tub, safe from floods and somewhat physically protected from damage. Refresh the contents every year on your birthday, perhaps donating the older packages to a local food pantry.

You can probably think of other useful supplies, like a generator and fuel, a deck of cards to pass the time, or insect repellent, but the point is to start helping yourself help yourself and avoid being a victim.

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A Few More Observations About 21st Century Emergency Communications Via Satellite

By Steve Stroh

It feels surreal to be writing about another weather disaster - Hurricane Milton that has severely impacted central Florida, USA, while the damage of Hurricane Helene in the region around Western North Carolina and Florida is still in the early stages of recovery.

In my opinion, the current "best bang for the buck" of emergency communications capability is to invest in a [Starlink Mini](#) and corresponding Starlink service, and an independent source of power for it such as the Ryobi 18V ONE+ 120-Watt Power Source With 12V Output that I discussed in [Zero Retries 0169](#). Turn on your mobile phone's Voice over Wi-Fi feature, and as long as the Starlink Mini has a clear view of the sky, and power (and your billing is up to date), you have a "works anywhere" mobile phone, text messaging, web browser, apps such as Facebook, weather, etc. With the Starlink Mini's Wi-Fi, laptops, tablets, even smart televisions have Internet access, with enough bandwidth to be able to share.

But however useful, Starlink Mini and its accessories is a dedicated set of hardware, and a subscription, that may not make sense (or be affordable) to many people. Thus, there really needs to be an alternative for the folks that have "just a phone" as their communications lifeline.

In the impacted area, Hurricane Helene wiped out most terrestrial communications infrastructure - cellular, landline, and most impactful, grid (mains) power. Battery backup systems and generators are just that - backup, not primary power sources. Battery backup systems bridge a gap of a few hours, or a few days at most, of loss of grid power and restoration of grid power. Backup generators can generally carry primary loads, but require regular refueling and periodic maintenance. It's also notable that restoration of all that destroyed communications infrastructure, especially in Western North Carolina and that region, may have to wait for roads not just to be cleared of debris, but in many cases entirely rebuilt. In some cases, construction of *entirely new roads and bridges* in a different area as that may be more practical, timely, and cost effective than restoration of destroyed roads and bridges. Thus "regular" communications may take weeks or months to be restored.

Apple iPhone Satellite Messaging

One of the lesser-told stories in these disasters is the availability and use of satellite communication features that were introduced in Apple's iPhone 14 in 2022, and have since been included in *all* iPhones since (not just the high end "Pro" models). When this feature was introduced, it was solely for "[Emergency SOS](#)", but Apple has now [enabled satellite communications for non-emergency \(text message\) communications](#). The built-in iPhone satellite communications capability certainly isn't as good as a dedicated satellite communications device such as a [SPOT](#) dedicated satellite communicator on the Globalstar satellite network (the same satellite system that Apple iPhones use) or a [Garmin InReach](#) (uses the Iridium satellite network). But using those networks require the (advance) purchase of a separate device, a separate (continuous) subscription fee, and they have to be with you when you really need it, and of course, having it charged up and accessible.

Thus, the device that you always have with you - your iPhone 14 (or later), that you'll be certain to grab on the way out the door, is arguably a reasonable compromise between the lower performance of the iPhone satellite communications, and the dedicated but higher performance dedicated satellite communicators.

Starlink and T-Mobile Special Temporary Authority to Activate Satellite to Phone Capability

While the iPhone satellite communications capability depends on new radios (or enhanced capabilities of the "radio chips") being built into the iPhone 14 models and later to access the dedicated spectrum of the Globalstar satellite network, a partnership between Starlink and T-Mobile in the US is taking a different approach to use *normal cellphones* to access Starlink satellites¹. This type of service is called Supplemental Coverage from Space (SCS). T-Mobile is the first² partner of SpaceX for this service³, and T-Mobile has reserved some of its terrestrial cellular spectrum - 1910 – 1915 MHz / 1990 – 1995 MHz for use on Starlink satellites that have additional radios and large, focused antennas for providing SCS. Starlink has not yet begun commercial service (nor received full permission to do so by the FCC) because not enough satellites are in orbit equipped to provide this service.

But, there are enough such "SCS" Starlink satellites in orbit to begin testing and SpaceX [requested a Special Temporary Authority \(STA\)](#) from the FCC to begin that testing on 2024-05-01 for a period of 180 days.

But then Hurricanes Helene and Milton hit, two weeks apart, and without mobile networks being operational, there are a lot of people that do not have any communications. They have phones and perhaps ways to charge them (generators, vehicles, etc.) - just nothing to connect to.

Thus a [new Special Temporary Authority \(STA\)](#) for folks in those affected areas will provide at least minimal services, per this tweet (?) by SpaceX on X dated 2024-10-06:

SpaceX and @T-Mobile have been given emergency special temporary authority by the @FCC to enable @Starlink satellites with direct-to-cell capability to provide coverage for cell phones in the affected areas of Hurricane Helene.

The satellites have already been enabled and started broadcasting emergency alerts to cell phones on all networks in North Carolina. In addition, we may test basic texting (SMS) capabilities for most cell phones on the T-Mobile network in North Carolina.

SpaceX's direct-to-cell constellation has not been fully deployed, so all services will be delivered on a best-effort basis.

While the service provided by this STA seems limited to T-Mobile customers, it's available for use on *any* recent mobile phone, not just iPhone 14s and later, or phones from other manufacturers.

Satellite to Phone Wireless Emergency Alerts

I was unaware of an even earlier STA that [Wireless Emergency Alerts via satellite was being tested](#):

T-Mobile Conducts the First Ever Wireless Emergency Alert Via Satellite

September 11, 2024

T-Mobile Starlink satellite-to-smartphone technology to bring critical emergency alerts to 500,000+ square miles of land currently unreachable with earth-based cell towers.

Emergency alerts will work for everyone – even Verizon, AT&T and other wireless provider customers will receive critical emergency alerts.

BELLEVUE, Wash. — September 11, 2024 — Hurricanes, tornadoes, fires - the type of catastrophic events that often trigger a wireless emergency alert - don't care about wireless coverage zones. Soon it won't matter.

Today, T-Mobile (NASDAQ: TMUS) announced that it successfully sent and received - for the first time ever in the U.S. - a wireless emergency alert (WEA) via satellite. The breakthrough opens up the 500,000 square miles of lightly populated, mountainous and/or uninhabitable land across the country to critical, life-saving emergency alerts.

"This is one of those days, as the CEO of a wireless company, that makes me pause for a moment and reflect on how technology advancements and the work we're doing is truly impacting life and death situations," said Mike Sievert, CEO, T-Mobile.

At 5:13 PM PT on Thursday, September 5th, T-Mobile initiated a test alert for a hypothetical evacuation notice. The alert was sent 217 miles into space where it was received by one of the more than 175 Starlink direct-to-smartphone satellites currently in low earth orbit that effectively function as cell towers in space. The alert was then broadcast to a geographic area impacted by the hypothetical evacuation notice and received by a T-Mobile smartphone.

In total, it took emergency operators just seconds to queue up an emergency message and deliver that message via Starlink satellites to users on the ground.

The life-saving benefits of satellite-enabled WEAs are immense. Take the 2018 Camp Fire in Northern California as an example. The fire, which ultimately burned more than 150,000 acres, forced the evacuation of 52,000 people, destroyed 19,000 structures including most of the city of Paradise and, most devastatingly, took 86 lives, erupted in the rural Sierra Nevada mountains.

Those who lived, worked or played off the cellular network grid - relatively common in lightly populated areas with significant elevation changes - had no access to emergency alerts due to lack of wireless service coverage. The fire also took out a reported 17 cell towers on the first day of the fire and 66 total during the first two weeks of the blaze making communications - with first responders or loved ones - nearly impossible for many.

T-Mobile and Starlink, with more than 175 direct-to-smartphone satellites currently in low-earth orbit, are currently testing satellite-to-smartphone service. Additional SpaceX launches are scheduled over the coming months to add more satellites to the current constellation, further blanketing the country with wireless coverage. As that happens, T-Mobile intends to beta test the service before launching it commercially.

While it's early days for Satellite to Phone technology, it seems clear that these new capabilities for mobile phone users will be yet another game changing communications technology, especially the Wireless Emergency Alert capability. While there is an existing, robust infrastructure for Emergency Alerts called [Emergency Alert System](#) that incorporates notifications via mobile telephone (when mobile phone service is available), broadcast television and radio, direct broadcast satellite, streaming television service, and the dedicated [NOAA Weather Radio All Hazards \(NWR\)](#) network of transmitters that can be received by compatible receiver units... those are all trumped by the one, primary device that everyone has readily at hand in an emergency - one's mobile phone.

Thus this new capability provided by T-Mobile and Starlink:

[Satellite] Emergency alerts will work for *everyone – even Verizon, AT&T and other wireless provider customers* will receive critical emergency alerts.

... answers a long standing issue that for many folks, their mobile phone is their *only* communications device. If that isn't working because mobile networks are down, they cannot receive emergency notifications. Thus this new capability of Satellite to Phone Wireless Emergency Alerts, once fully operational, seems destined to save many lives by providing reliable emergency alerts, regardless of the state of the terrestrial infrastructure.

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By Steve Stroh N8GNJ

This article has been queued for approximately two months, since I read the referenced editorial by ARRL CEO David Minster NA2AA. I truly didn't want to "just pick a fight" with ARRL, so I decided to hold this article and really consider whether it would be a constructive critique, or merely yet another critique of ARRL.

My original plan was that if I decided to go forward with this, I would make it an open letter to many of the ARRL leadership (direct email in addition to publishing in Zero Retries). But in the wake of ARRL's disenfranchisement of challenges to the current regime, such an approach, which depends on a good faith effort to be receptive to change and improvement, is pointless. Thus I'm running this as an article in Zero Retries to explain how subtle and corrosive the ARRL's attitude is within Amateur Radio to Technician class Amateur Radio Operators who ARRL seemingly doesn't consider "real" Amateur Radio Operators.

For background to those outside the US or new to Amateur Radio, ARRL is the primary national Amateur Radio organization in the US. The Amateur Radio license classes discussed herein are relevant to the US, administered by the US Federal Communications Commission (FCC). David Minster NA2AA is the current Chief Executive Officer of ARRL.

In his ["Second Century" column in the 2024-08 issue of QST](#), "The Ecosystem of Becoming a Ham", ARRL CEO David Minster NA2AA said:

There is a significant percentage of people who become licensed and then never progress within amateur radio.

The implicit assumption NA2AA makes in this statement, using the word "progress", is that once someone attains their (entry level) Amateur Radio Technician license, that it's desirable, expected, or "normal" for one to "... progress... within Amateur Radio" to obtain a General or Extra class Amateur Radio license.

In my opinion, NA2AA's statement is *arrogant* at best, *exclusionary at worst*.

It's a reasonable inference from NA2AA's statement that he considers Technician class Amateur Radio Operators to be "less equal" in US Amateur Radio, if they (in his words) "never progress within Amateur Radio". And, by extension given that his statement appeared in ARRL's primary publication, and did so under his title as the Chief Executive Officer of the ARRL, it's a further reasonable inference that this is also the position of ARRL.

To be clear, **Technician class Amateur Radio Operators** are fully licensed, fully equal, fully capable, fully equivalent Amateur Radio Operators, with the exception that Technician class Amateur Radio Operators have fewer operating privileges than General or Extra class licensees on Amateur Radio bands below 50 MHz.

Technician class Amateur Radio licensees have full privileges on all US Amateur Radio bands above 50 MHz⁴; *identical privileges in those bands* as General and Extra class Amateur Radio licensees. That includes use of VHF / UHF repeaters (and building, and being a trustee for repeaters), data activities such as APRS and Packet Radio, all space-related Amateur Radio activities, the ability to build and operate one's original, experimental equipment, and networking and experimentation in the Amateur Radio microwave bands.

Many of those with a Technician class Amateur Radio license consider the *many* capabilities in Amateur Radio enabled by their Technician class Amateur Radio license to be a significant achievement and provide a rich Amateur Radio experience. As an example, my primary motivation to get my Amateur Radio license in the mid 1980s was to participate in Packet Radio activities on VHF and UHF. At the time I obtained my Technician class Amateur Radio license I had little interest in HF operation and obtaining a General, Advanced, or Extra Amateur Radio license because the data capabilities on HF were limited (at that time) in comparison to the amazing things that were being done on VHF and UHF.

There is no more evidence needed of the severe disconnect that NA2AA, and the ARRL in general, have towards newer generations of Amateur Radio Operators than a recent article by Dan Romanchik KB6NU - [Back to the future: Are hackers the future of amateur radio?](#) Many new (Technician) Amateur Radio Operators are entering Amateur Radio from a technology background, achieving their Technician class Amateur Radio license, and then using that license effectively to experiment and learn and have fun in Amateur Radio.

As for a Technician class Amateur Radio licensee needing to "progress in Amateur Radio" to a General or Extra Amateur Radio license to "work the world", thanks to widespread repeater linking extending beyond the US, Technician class licensees can indeed "work the world" through repeater linking networks such as Brandmeister, AllStarLink, Internet Radio Linking Project (IRLP), EchoLink, WIRES (Yaesu), Internet Gateway (Icom), PNWDigital (includes Canada), and other such networks.

I respectfully suggest that if ARRL is to live up to its stated goals⁵ (excerpted):

ARRL The National Association for Amateur Radio® in the United States...

... strives for every member to get involved, get active, and get on the air; encourages radio experimentation and, through its members, advances radio technology and education...

Every member? Even Technician class Amateur Radio licensees that "never progress within Amateur Radio"?

In my opinion, the ARRL is severely in need of a significant reorientation of its perspective in Amateur Radio to reflect that Technician class Amateur Radio Operators *are fully equal within US Amateur Radio*, and their capabilities and participation as Technician class Amateur Radio Operators within Amateur Radio *should be encouraged*, rather than made to feel less than fully accepted within Amateur Radio even if they "never progress within Amateur Radio".

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ZR > BEACON

By Steve Stroh N8GNJ

Short mentions of Zero Retries Interesting items.

Audio Recording in ka9q-web

Franco Venturi on the ka9q-radio email list:

Philip Gladstone just added support for audio recording to 'ka9q-web'.

His changes are in the new 'audio-recording' branch: <https://github.com/fventuri/ka9q-web/tree/audio-recording>

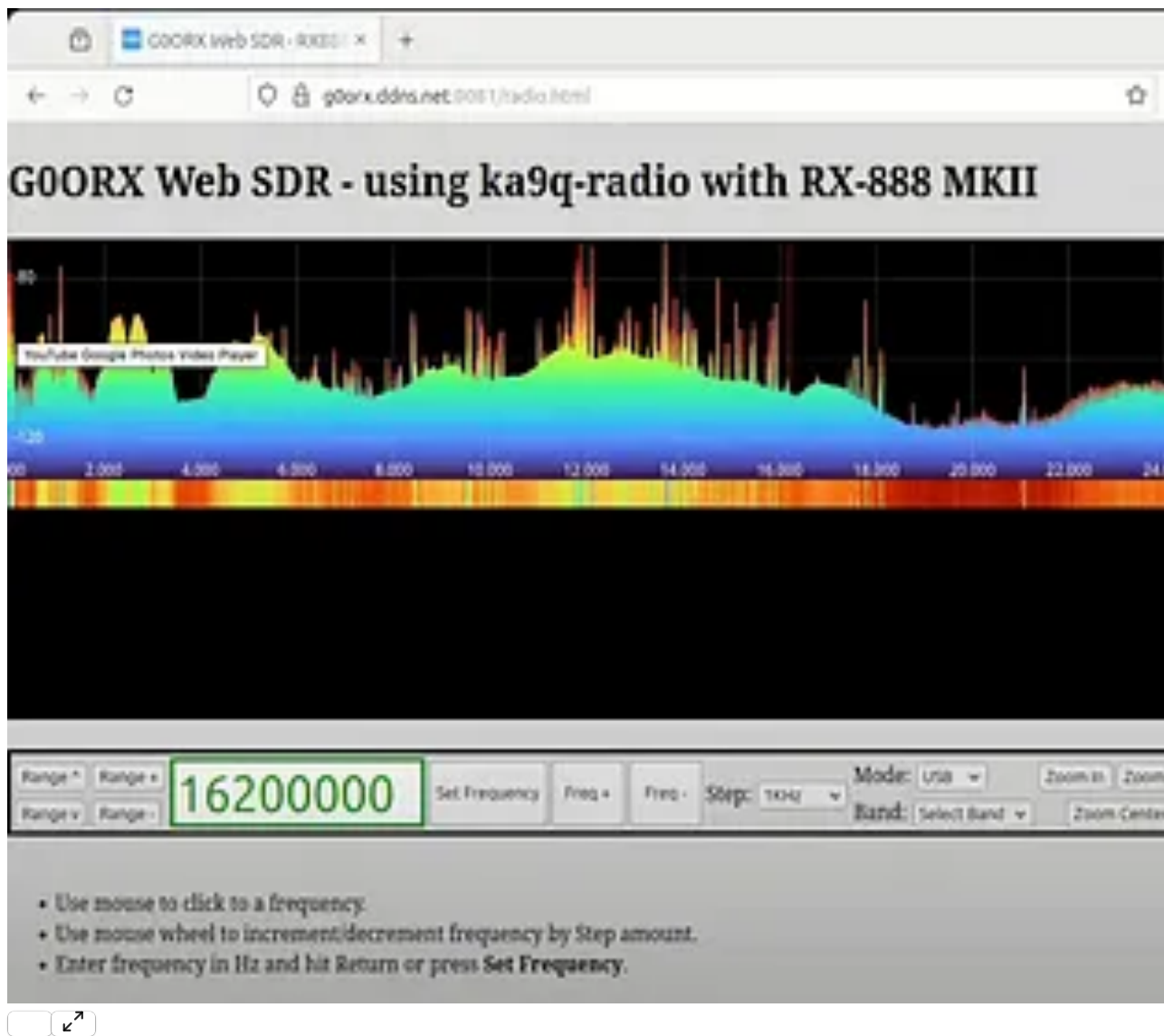
Please give it a try, and let us know your feedback either here or in the 'ka9q-web' repository (<https://github.com/fventuri/ka9q-web/pull/7>).

Many thanks to Philip for his work!

Franco

ka9q[-radio]-web?!?!?

This new recording capability is a nice addition and something a lot of us have wanted. Who wouldn't want to be able to listen to *all* of one of our VHF / UHF bands in our area, or with enough hardware and a big enough computer and hard drive, *all of all* of our VHF / UHF bands in our area. *But that's burying the lede a bit.* This was the first (that I recall) mention of an actual (web) graphical user interface for the ka9q-radio system! And, following true to form for ka9q's "just the command line", there's no graphic on the ka9q-web repository. 😊 Fortunately I was able to find [this conversation thread](#) with a link to a [video of ka9q-web in operation](#) - screenshot from that video below.



Amazing capabilities, and open source. I can't imagine how good this will get when / if KA9Q and friends decide to implement a transmit function for ka9q-radio.

amprv6.org

Maiko Langelaar VE4KLM on the nos-bbs email list:

On a whim, last year sometime, I decided to grab :

amprv6.org

A bit easier then remembering the IPV6 address :

ve4klm.amprv6.org

Anyone else interested ? Contact me off list.

The subdomain must be IPV6 connected.

* Amateur Radio only - no commercial or business use

Maiko / VE4KLM

And... with this, the migration of Amateur Radio use of IPv6 beyond ARDC, 44Net, ampr.org, etc. is underway. I know that ARDC has their hands full trying to modernize 44Net, but IPv6 is clearly the wave of the future in Amateur Radio TCP/IP and I'm glad that VE4KLM decided not to wait for something "official" regarding IPv6 from ARDC.

Let's play with IPv6!

[Meet Schuyler Erle N0GIS, ARDC's New Director of Technology](#)

Rosy Schechter - KJ7RYV on ARDC's News and Updates page:

ARDC is pleased to welcome Schuyler Erle N0GIS to our team, as he takes the reins as our new Director of Technology. He's got a history in open source, ham radio / wireless tech, and engineering management, and he's worked in both corporate and nonprofit environments, all together making him uniquely qualified for this important role.

Schuyler has been involved in open source software development since the late '90s. In the early 2000s, Schuyler helped establish [NoCat.net](#), a rural community wireless network cooperative in Sonoma County, California, providing high-speed Internet access for the first time ever to members in the coastal hills. Schuyler also led software projects to distribute the first open source wireless captive portal, as well as interactive line-of-sight evaluation tools for point-to-point microwave networking.

This last project impressed on Schuyler the importance of geographic analysis for community development. In 2005, he co-authored [Mapping Hacks](#), published by O'Reilly Media, which promoted the growing field of Free / Open Source geographic information systems. In 2006, Schuyler helped found the [OpenLayers](#) project, the first F/OSS dynamic map client available on the Web, which is still widely used and under active development today.

Schuyler got his amateur ticket in 2011 and currently holds a General license. For several years, he was an active participant in the City of San Francisco's Auxiliary Communications Service, which provides the city with amateur radio communications capacity in times of need.

More recently, Schuyler has served as a software engineering leader at a number of early- to mid-stage Silicon Valley tech startups, but he's excited to get back to his real passions of Open Source innovation and technical community development.

Schuyler describes himself as "humbled and honored" to be joining ARDC, citing "the proud history of 44Net as a foundational part of the Internet," as well as "the substantial ability of ARDC to support the work of the amateur radio community."

"I think amateur radio has a huge role to play in our society in the 21st Century, and I think ARDC has a critical part in that story," Schuyler says. "Now, as much as ever, I think it's vital for us to continue leaning into the 'service' aspect of the Amateur Radio Service."

Schuyler also makes no bones about the fact that he's delighted to have the excuse to rebuild his ham shack in his new home in Portland, Oregon, so he can get back to HF operation. He's also excited about dusting off some neglected digital mode projects, and is already studying for his Extra exam.

And we make no bones about how happy we are to have him on the team. Welcome aboard, Schuyler!

I'm delighted that N0GIS is / will be an active Amateur Radio Operator interested in "digital mode projects". It's good to see, with N0GIS and the earlier hire Adam Lewis KC7GDY for IT & Development Manager, that ARDC is beginning to get fully (re) staffed after a pretty rough year.

[ARDC Committee Recruitment 2025](#)

The deadline for applying for these positions is October 31, 2024.

ARDC is now accepting applications from individuals interested in serving on our committees in 2025.

[Grants Advisory Committee \(GAC\)](#) – reviews grant applications

[Technical Advisory Committee \(TAC\)](#) – works on 44Net-related projects and policies

[Grants Evaluation Team \(GET\)](#) – evaluates and analyzes grant reports

[Conduct Review Committee \(CRC\)](#) – helps to evaluate Code of Conduct incident reports (Starting in 2025: must concurrently serve as a member of GAC, TAC, or GET).

Links to detailed information about each of these committees can be found above.

I can recommend participation in ARDC's volunteer committees to Zero Retries readers as a truly meaningful experience in Amateur Radio. There are many other ways to spend one's scarce "Amateur Radio volunteer time" in other organizations, but I guarantee you that if you are selected for an ARDC volunteer committee, you'll look back on the experience years later as *time well spent doing impactful work*.

In my experience, ARDC really values its volunteers and the ARDC staff works hard to minimize the "hassle factors" of volunteering.

ARDC just released a snapshot of some of its recent, most high-impact grants: [Grantee Roundup, October 2024](#). While I wish ARDC was maintaining its [\(2024\) Awarded Grants page](#), especially now that it's completed its 2024 "granting season", highlighting these five grantees give at least some flavor of the impact that ARDC is making with its grants in 2024.

The GAC has the most immediate impact in Amateur Radio, deciding how and where to disburse limited grant funds. One of the most lasting impressions I have from my two years on the GAC is the incredible innovation *that is going on in, and adjacent to Amateur Radio*. Even if ARDC doesn't fund a particular project(s), you'll inevitably be impressed and enlightened from the many grant proposals that you'll see that Amateur Radio isn't the "same old, same old" that you read about in mainstream Amateur Radio publications.

ARDC's Technical Advisory Committee does most of its work behind the scenes and has spent most of 2024 on a revamp / update / self-service portal to enable greater use of 44Net. I've been contacted by some former TAC volunteers that were frustrated at the slow progress within the TAC, but perhaps now that ARDC has staffed up its two primary technical positions, that will help enable more, and more visible, progress by the TAC in 2025.

[Wi-Fi Goes Long Range on New WiLo Approach](#)

Michelle Hampson in IEEE Spectrum:

The new technique could underpin agricultural sensor networks and smart cities.

Researchers have developed a hybrid technology that would combine Wi-Fi with the [Long Range \(LoRa\) networking protocol](#), yielding a new long-distance wireless concept called WiLo. The research team has designed their proposed WiLo tech to be used on existing Wi-Fi and LoRa hardware.

The advance may find applications in [Internet of Things](#) (IoT) technologies—such as networks of long-range sensors used in agriculture or smart cities.

[Demin Gao](#), a professor in the College of Information Science and Technology at [Nanjing Forestry University](#) in China, notes that Wi-Fi has limitations today in its range and its high power consumption. By contrast, LoRa is based on low power requirements that yield long-range communication capabilities and is often used for IoT applications.

In WiLo, the two communications protocols have been combined to maximize advantages of each one, without the need for additional tech to bridge the two systems. "This reduces costs, complexity, and potential points of failure, making IoT deployments more efficient and scalable," Gao says.

The researchers—hailing from universities in Hong Kong, mainland China, South Korea, the United States, and the United Kingdom, as well as [Intel](#) employees in Germany—conducted their WiLo experiments using an off-the-shelf [SX1280](#) LoRa transceiver produced by Semtech. And while the SX1280's 2.4 GHz communications band is shared with Wi-Fi (and a host of [other standards and technologies](#)), Wi-Fi and LoRa signals are not compatible.

So the researchers developed an algorithm to manipulate the frequency of Wi-Fi's data transmission signals to match the signals that the LoRa device uses to communicate with other devices. In technical terms, they manipulated Wi-Fi's data multiplexing standard (called [OFDM](#)) to emulate the longer-ranged chirp signals used in LoRa's chirp-spreading standard (called [CSS](#)).

This is an interesting approach that if they made it into an open standard, potentially it could be adapted for OpenWRT and thus for AREDN given that AREDN is based on OpenWRT and runs on 802.11 / Wi-Fi and Wireless ISP hardware.

I'm a bit skeptical that this is a *practical* approach given the low cost of Wi-Fi chipsets (optimized for short range and high data rates) and LoRa chipsets (optimized for long range and lower data rates). But, I'm regularly surprised about radio technology these days. There's always a demand for standards-based technology to displace proprietary technology; as widely used and inexpensive, as LoRa has become, it's a proprietary technology ultimately supplied by one company.

[CESSB update \(Controlled Envelope SSB\) on the QMX+](#)

Hans Summers G0UPL on the QRPLabs email list:

I'm so happy. That's why I am writing this. CESSB works! I have recorded a 1-minute YouTube demo (Churchill's speech still) showing a QMX receiving QMX+ CESSB transmissions, more on this below.

CESSB (Controlled Envelope Single Sideband) reminder: the place to read about it is the original ARRL QEX article published in November 2014 by David L. Hershberger, W9GR:

https://www.arrl.org/files/file/QEX_Next_Issue/2014/Nov-Dec_2014/Hershberger_QEX_11_14.pdf.

However that article is focused on generating SSB by a conventional SSB exciter. I struggled with thinking about how to apply that to the rather special case in QMX where we are generating SSB by EER (Envelope Elimination and Restoration) which is a rather different process, though also involving the inevitable Hilbert Transform.

In the end I decided I did not NEED to do it exactly the same way it's done in the article: in QMX SSB via EER, we have separated the signal into phase and amplitude components. I realized that this fact can be used to ADVANTAGE. I developed a completely different way of generating CESSB to the one in the article. I guess I shall have to write down all the details carefully to document all this.

I learned about this development in an article on John Harper AE5X's blog post ([\(CE\)SSB with the QMX+](#)), where I think he summarized the achievement very well:

I'm getting my mic ready!

When the CESSB-enabling firmware is released, the QMX+ will be a high-performing 6-160m CW/SSB/digital transceiver for \$125. Truly amazing.

Here's a quick reminder of just how impressive the [QMX+](#) is:

The "QMX+" (**Q**RP+ Labs **M**ultimode **X**cvr): a feature-packed, high performance, 160-6m 3-5W CW and Digi-modes transceiver kit, including embedded SDR receiver, 24-bit 48 ksps USB sound card, CAT control, synthesized VFO with TCXO reference, CR2032 battery backed RTC, and internal GPS option. QMX+ may be used in CW modes standalone, or with a single USB cable to a PC for digi mode operation. QMX+ also incorporates standalone CW, FSKCW and WSPR beacon functionality (no PC connection required).

All that for \$125 (kit) or \$185 (assembled) and an additional \$25 for the nice enclosure.

Plus, *it just looks cool*. I really like that 6m (eventually CESSB) capability!



Image courtesy of QRP Labs

[KV4P HT - Turn Your Android Phone Into a Modern Ham Radio Transceiver](#)

Free open source software & hardware

What is it?

kv4p HT is a homebrew VHF radio that makes your phone capable of voice and text communication completely off-grid with at least a Technician class amateur radio license.

The radio simply plugs into the USB C port on your Android smartphone and transforms it into a fully-fledged handheld radio transceiver. It's completely open source ([GPL3](#)): the Android app, ESP32 firmware, PCB designs, and 3D printer files.

It's small enough to fit in your pocket and take anywhere, and since it has no internal battery it's the perfect radio to put in a go-bag or your car's glove compartment.

NOTE: kv4p HT is an open source project you build yourself and has absolutely no warranty, or guarantees on functionality or reliability! That said, have fun. :)

This is a *cool Zero Retries Interesting project* by Vance Vagell KV4P, and yet another Zero Retries Interesting YouTube channel subscribed to. We need more simple VHF / UHF radio units like this! My thanks to Cale Mooth K4HCK and Eric Moritz K3FNB for their respective mentions of this on Mastodon.

The variations of this that I could imagine are integrating the new QPSK 3600 bps mode for the NinoTNC, or the [CATS hardware](#), or adding the robust [Ribbit / Rattlegram modulation](#).

Leave a comment

Share

Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out

Join the Fun on Amateur Radio for some pointers.

Zero Retries Frequently Asked Questions (FAQs) — In development 2023-02.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with radio technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to everyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing *Thanks* to:

- Tina Stroh KD7WSF for, well, *everything*!
- **Annual Founding Members who generously support Zero Retries financially:**
 - Founding Member 0000 - Steven Davidson K3FZT (Renewed 2024)
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<https://www.zeroretires.org>

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Zero Retries Administrivia - Activating Payment Options.

These blogs and newsletters regularly feature Zero Retries Interesting content:

- [Dan Romanchik KB6NU](#) mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- [Jeff Davis KE9V](#) also mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- [Amateur Radio Weekly](#) by Cale Mooth K4HCK is a weekly anthology of links to interesting Amateur Radio stories that often feature "Zero Retires Interesting" topics.
- [Experimental Radio News](#) by Bennet Z. Kobb AK4AV discusses (in detail) Experimental (Part 5) licenses issued by the US FCC. It's a *must-read-now* for me!
- [RTL-SDR Blog](#) - *Excellent* coverage of Software Defined Radio units.
- [TAPR Packet Status Register](#) has been published continuously since 1982.
- [Hot Iron - The Journal of the Constructor's Club](#) is a delightful quarterly newsletter.
- Other Substack Amateur Radio newsletters recommended by Zero Retries.

These YouTube channels regularly feature Zero Retries Interesting content:

- [HB9BLA Wireless](#) by Andreas Spiess HB9BLA
- [KM6LYW Radio](#) by Craig Lamparter KM6LYW (home of the [DigiPi project](#))
- [Modern Ham](#) by Billy Penley KN4MKB
- [Tech Minds](#) by Matthew Miller M0DQW

These podcasts regularly feature Zero Retries Interesting content:

- [Store and Forward](#) - a podcast about the past and future of amateur radio, by Kay Savetz K6KJN (curator of the [Digital Library of Amateur Radio and Communications](#)) and Steve Stroh N8GNJ (Editor of Zero Retries).
- [Ham Radio Workbench](#) by George Zafiropoulos KJ6VU (and friends)
- [Foundations of Amateur Radio](#) by Onno Benschop VK6FLAB

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Email issues of Zero Retries are “instrumented” by [Substack](#) to gather basic statistics about opens, clicking links, etc.

More bits from Steve Stroh N8GNJ:

- [SuperPacket blog](#) — *Discussing new generations of Amateur Radio Data Communications - beyond Packet Radio (a precursor to Zero Retries)*
- [N8GNJ blog](#) — *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs in Bellingham, Washington, USA*

Thanks for reading!

Steve Stroh N8GNJ / WRPS598 (He / Him / His)

These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham ([The City of Subdued Excitement](#)), Washington, USA, and linked to the Internet via [Starlink Satellite Internet Access](#).

2024-10-11

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Footnotes for this Issue

[1](#)

Two other companies - [Lynk Global](#) and [AST SpaceMobile](#) have proposed Supplemental Coverage from Space (SCS) services using dedicated satellites with large, very high gain antennas. As I read it, both companies have done some testing, including putting prototype satellites into orbit, to validate the concept of dedicated satellites for SCS service, but neither currently has a full plan (including funding) to provide SCS service.

The biggest difference between Starlink’s approach for SCS and that of Lynk Global and AST SpaceMobile is that Starlink’s satellites also provide Broadband Internet Access in addition to SCS, and the other two companies’ satellites are dedicated to just SCS. In my opinion, the dedicated satellite approach has a hard path to being commercially viable, especially because they will be “leasing” spectrum from mobile carriers to provide their services.

[2](#)

Starlink has made it clear that while T-Mobile is the “launch partner” for its Supplemental Coverage from Space (SCS) service, and Starlink SCS will be exclusive to T-Mobile for one year, Starlink intends to work with other mobile carriers in other countries to provide SCS. There’s nothing unique in SCS to T-Mobile that can’t be replicated by other carriers. I’ll guess that the SCS antennas and electronics on these newest Starlink satellites are flexible enough that it can change bands when over various countries that prefer to use other bands for SCS.

[3](#)

Starlink’s satellite manufacturing facility is located in Redmond, Washington, USA. T-Mobile is headquartered “next door” in Bellevue, Washington, USA. It’s not hard to imagine that this idea began over beers at one of the many, many brewpubs in the Seattle suburbs.

[4](#)

ARRL offers a good visual representation of Amateur Radio privileges per license class - <https://www.arrl.org/files/file/Regulatory/Band%20Chart/Band%20Chart%20-%2011X17%20Color.pdf>.

[5](#)

This statement is included in every issue of QST, in the “fine print” (page 14, lower left corner of the 2024-08 issue of QST).